



Tropical Factsheets

The Canopy

When we look down from an aeroplane onto the rainforest canopy we see a green roof obscuring the ground below. What we are seeing are billions of leaves feeding. They are guzzling sunlight.

- Animals eat other organisms, living or dead. Plants on the other hand, make their own food. They are the only living organisms that can capture energy from the sun and, through photosynthesis, use it to produce sugar and other material to build their cell structures.
- **Each leaf is a solar cell.** The canopy is a vast solar panel. The different canopy layers of the forest is determined by different amounts of **sunlight** required for each plant species. There is fierce competition by different plant species for this vital energy.
- Stretching high on tall, straight trunks, trees don't waste energy on producing branches until they reach the top canopy and are able to compete successfully with their neighbours for available light. Trunks can be branchless to heights of 30m (three storeys) or more. (The same trees, grown in full light in a park or garden without competition from neighbours will branch early in life and grow into shorter, bushy trees with completely different shapes).
- The canopy is an interlocking network of sun-hungry leaves. It is so efficient that only 3 - 15 per cent of sunlight penetrates this uppermost tree canopy to reach the lower undergrowth.
- Not all of the light is caught by the topmost leaves. **Leaves at the top of the canopy** tend to be angled so that they are not fully exposed to the sun. This prevents them from being damaged by the intensity of the tropical sun. This also allows sunlight to be shared by leaves lower in the canopy.
- **Leaves lower down**, unlike those at the top of the canopy, grow **horizontally** to capture all the rays reaching them. The leaves of most plants move into the efficient positions to capture the most sunlight without becoming damaged. The leaf angles alter with changes in light between wet, cloudy seasons and dry, sunny seasons.
- Few plants can survive in the **very dim light of the forest floor.** Those that do survive, such as **ferns**, depend on **sunflecks**, which are patches of sunlight that reach parts of the forest floor for only a few seconds a day. The dark green leaves of forest floor plants are very efficient at capturing sunlight. These plants also seem to respond very quickly when they are lit up. (With most plants there is a time lag after exposure to light, before photosynthesis begins.) Forest floor plants switch on quicker — as soon as the sun fleck hits them — and photosynthesise longer after the light has gone.